metrial cells. The Papanicolaou smear is but a screening test, and under ideal conditions there is a false-negative rate of 5% for intraepithelial disease and of 20% to 30% for invasive carcinoma of the cervix.

Once an abnormal result is obtained from a smear, the cervix should be examined colposcopically. The location and extent of the lesions can be delineated and possible extension towards and into the endocervical canal ascertained. Distinction can be made between intraepithelial and invasive cancer and histologic correlation can be obtained by biopsy and endocervical curettage. The technique of colposcopy is described in various publications.

When the entire lesion is visible and histologic and cytologic examinations show mild to moderate dysplasia, the treatment of choice is cryotherapy or, where available, laser evaporation. When there is disease in the endocervical canal, conization of the cervix is recommended. In cases where there is severe dysplasia or carcinoma in situ (cervical intraepithelial neoplasia grade III) and the whole lesion is visible, there is controversy whether cryotherapy or laser evaporation is appropriate, as the incidence of residual disease or subsequent invasive cancer seems higher than in those treated by conization.

The American Cancer Society has recently recommended changing the screening from one to three years, but the American College of Obstetricians and Gynecologists disagrees and recommends annual smears for all sexually active women because the risks of invasion in patients with undetected carcinoma in situ, or cervical intraepithelial neoplasia, increases exponentially as the interval between cytologic examinations increases. CAROLINA A. BRAGA, MBBS

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Human In Vitro Fertilization and Embryo Transfer

THE EXTRACORPOREAL fertilization of mammalian oocytes was first reported more than 20 years ago. Since that time more than ten different species of mammalian oocytes have been successfully fertilized in vitro. In the past three years, reports of successful human in vitro fertilization and embryo transfer have been received from England, Australia and the United States. The use of an in vitro fertilization and embryo transfer system to deal with various factors encountered in infertility situations is becoming more common.

Currently clomiphene citrate or human menopausal gonadotropin (Pergonal) therapy is used as the primary method to stimulate multiple follicle development and indirectly help time laparoscopic oocyte recovery. In conjunction with ovarian stimulation, patients have daily ultrasound scanning of the ovaries and serum specimens are taken for measurement of estradiol levels. Before laparoscopic aspiration, human chorionic gonadotropin is given to initiate final maturation of the oocyte.

With the use of ovarian stimulation and intravenous administration of human chorionic gonadotropin, it has been shown that laparoscopy should be done 36 hours from the time of the latter injection. The laparoscopy is done using general anesthesia and routine laparoscopic techniques. A special oocyte-aspirating system is currently being used in which a 14-gauge needle with an interlining of 18-gauge Teflon goes into a fluid trap and is connected to a wall suction set at about 150 mm of mercury negative pressure. By monitoring with combined ultrasonic and hormonal methods and with the Teflon-lined aspirating system, we are able to recover oocytes in about 85% of the follicles aspirated.

About five hours after the laparoscopic recovery of the mature oocyte, the husband is asked to produce a semen specimen. After preincubation of the sperm, 50,000 motile cells are then added to the plate containing the oocyte. At about 40 hours from the time of fertilization, the oocytes are inspected and at this time four- to eight-cell embryonic development should be observed. Once normal embryonic development is seen, transfer back into the patient's uterus is undertaken, using a Teflon catheter system.

Work on the human in vitro system began early in 1970; however, pregnancies have occurred only within the past five years. The overall pregnancy rate in any given program is about 15% to 20% of patients treated. The problems we face today with this fertility procedure are slowly being solved. The techniques that may become applicable in the near future are ultrasound-directed, needle aspiration of mature oocyte, thus alleviating the need for general anesthesia and laparoscopic aspiration. Moreover, with growing evidence of successful cryopreservation techniques in animals, the possibility of human embryo cryopreservation may become a reality. These techniques appear viable but must be tested extensively before they are available for use in humans. RICHARD P. MARRS, MD

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The Use of Ultrasound in Infertility Management

ESTIMATES ARE that one out of every six couples requires medical assistance to achieve a pregnancy. For most of these, where no pathologic condition exists, precise timing of ovulation is the most critical element for success. Whereas the use of drugs such as clomiphene citrate (Clomid) or menotropins (human menopausal gonadotropin [Pergonal]) often better define the ovulatory period, the more conventional mea-